

## Ecosystems: Terrestrial and Aquatic

### 5-2 Students will demonstrate an understanding of relationships among biotic and abiotic factors within terrestrial and aquatic ecosystems. (Life Science)

#### 5.2.1 Recall the cell as the smallest unit of life and identify its major structures (including cell membrane, cytoplasm, nucleus, and vacuole).

**Taxonomy level:** 1.1 and 1.2-A Remember Factual Knowledge

**Previous/Future knowledge:** This is the first time students have been introduced to cells. In 7<sup>th</sup> grade (7-2.1), students will summarize the functions of the components of plant and animal cells, including the cell wall, the cell membrane, the nucleus, chloroplasts, mitochondria, and vacuoles).

**It is essential for students to know** that all organisms are made of cells.

- The *cell* is the smallest unit of living material having major structures within it allowing it to live.
- Some kinds of organisms are just one cell. This single cell is the organism's entire body.
- Many organisms are made of more than one cell.

Cells vary in size, but all cells contain these major structures:

#### *Cell membrane*

- The soft, flexible outside covering of a cell that controls what comes in and out of a cell.

#### *Cytoplasm*

- The gel-like fluid that fills most of a cell. The other organelles are found in the cytoplasm.

#### *Nucleus*

- A small structure that controls everything the cell does.

#### *Vacuole(s)*

- Are storage spaces in the cell.
- They can hold water and other nutrients that the cell needs.
- They can also store wastes until the cell can get rid of it.

**NOTE TO TEACHER:** It is appropriate to introduce the mitochondria (where energy is made) as a major structure common to all cells.

**It is not essential for students to know** the other parts of a cell (mitochondria, cell wall, or chloroplasts), to compare plant and animal cells, or to know various types of cells found in the body (blood, muscle, nerve).

#### **Assessment Guidelines:**

One objective of this indicator is to *recall* the cell as the smallest unit of life; therefore, the primary focus of assessment should be to remember that the smallest unit of all organisms is the cell.

Another objective of this indicator is to *identify* the major structures of a cell; therefore, the primary focus of assessment should be to *recall* these major structures (including cell membranes, a nucleus, vacuoles, and cytoplasm) in cells.